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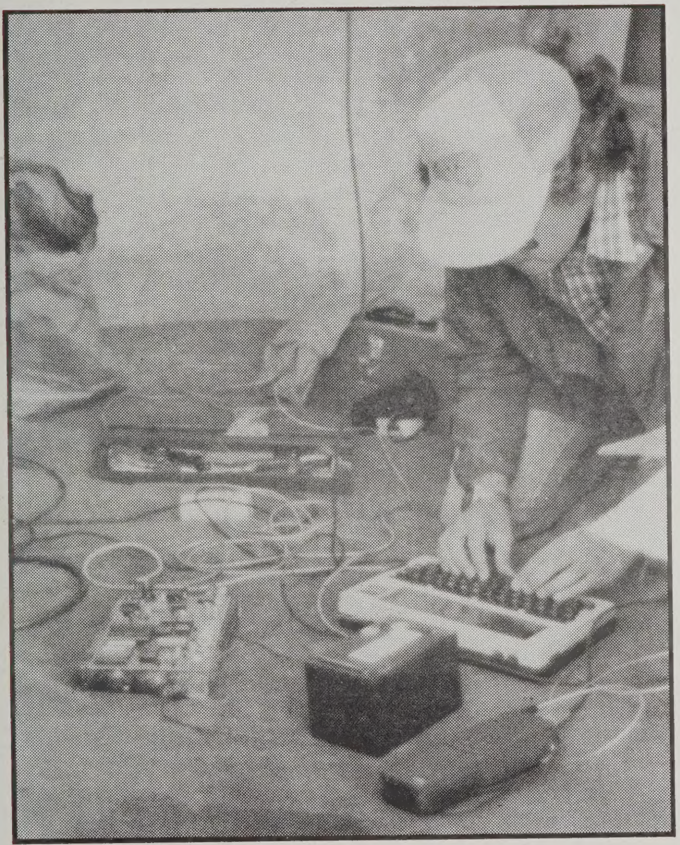
PACKET RADIO MAGAZINE

Dedicated to the Advancement of Packet Radio



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News and Views

Gwyn Reedy, W1BEL, PRM Editor

Packet radio is the real "growth sector" of amateur radio. While Wayne Green and the ARRL variously bemoan the low license renewal rate and attempt to turn around the trend in different ways, the packet groups just keep on growing and attracting more people to their ranks. I am finding that packet (data communications in general) is interesting people that are not licensed amateurs and causing them to devote the time necessary to get a license. Just as importantly, many inactive or previously licensed amateurs are renewing their interest and activity in the hobby.

For those of us on packet already, there is going to be growth and improvement over the coming months and years. Many packeteers are using two and three TNCs in their shacks. Nob Itoh, JA1KSO, has 4 BBS operating, one for each major band in use for packet in Tokyo. Between the BBSs and digipeaters and personal station gear he is using seven TNCs. In addition he is going to install several TNCs in his automobile trunk with remote terminal operation from the driver's compartment to support a packet 'county hunters' type of mobile operation. I doubt that most amateurs will have that elaborate an operation, but TNCs will soon be as commonplace around the shack as a 2 meter radio is now. The real growth will come in improved equipment for higher speed communication. Rumors abound that Kantronics is close to announcing a higher speed TNC for the amateur market. It will probably be one of several approaches to increasing the throughput of our packet networks. There is bound to be some turmoil in this area until standards (de facto or otherwise) are established. The primary problem restricting higher speed operation in home stations is the need to run the signals in the microphone connector or else modify the radio to support a special data input. When and if radios become widely available that support a flat passband which is wider than that accommodated by current audio stages, or allow direct FSK from a connector on the rear panel, then designers will have many more options to provide high speed data communication.

A plea to PRM readers: Please send in photographs, drawings and other graphic items for use in PRM. Note the page after of (good) text in this issue, but it is not visually interesting. We will begin using modern 'desktop publishing' techniques as we have time to learn them, but the best improvement will be photos. If we can get good photos, we will publish them. Let me hear from you!

- PRM -

OUR COVER: QRP Field Day, 1985. [Left] Steve Goode, K9NG, operating battery powered QRP packet. [Right] Pete Eaton, WB9FLW, preparing to launch the upper end of a balloon tethered antenna.

EZ – Packet 80 : A Review

John Belham, Jr. W5PDG
2302 Middlecoff Dr.
Gulfport, MS 39501
(From the MARDA group)

Writing a review is not my bag, but when a program like EZ-PACKET-80 came along I felt like I needed to share it with everyone possible. Operating packet with a TRS-80 model 4 and a telephone terminal program left a lot to be desired. It seemed the only answer was to buy a new computer that offered split screen operation with buffers to enhance the packet operation. However a new computer is not the answer. The problem was solved completely with a program called EZ-PACKET-80 from The Martin Company (formally Crown Microproducts) of Marysville, WA. Through the programming skill of WA7HTN, Packet with the TRS-80 computer took on a completely new meaning.

EZ-PACKET-80 is available for the TRS-80 models I, III and 4/4P/4D computer with features that include split screen operation, 64 or 80 column display depending on the model computer used, copy to a buffer of received information, autosave of information to disk, up to 30K of Main text buffer space, 3 special buffers of 200 characters each, plus 10 programmable 140 character line buffers and a full text editor. In addition to these main features there are a number of other goodies like a video timer to prevent the CRT from being burned during long hours of operation, text formatting, printer control, and the ability to configure and save your own custom program and buffers for autoboot operation.

There are two versions of the program available for each model computer. The version called TRSPACK uses the normal RS-232 output of the computer to connect to the TNC. The ROMPACK version however, allows the TNC to be connected to the B-PORT of the Crown ROM-116 RTTY computer interface. This version is great for a computer that is not equipped with an RS-232 board or in the case where the RS-232 output is being used with a telephone modem etc. With the ROMPACK version, operation of the computer can be changed from Modem to Packet to RTTY and back simply by changing the software. Other than the sign on message both versions of the programs look and operate alike. Anyone having used the ROM-116 Rtty program will feel right to home with the operation of EZ-Packet-80 for many of the features and commands are similar.

On initial start up you will need to select the baud rate of the TNC to the terminal connection, then you are ready to load the buffers to create your own personalized packet terminal program. The 200 character ITEXT buffer allows you to send beacon text, beacon time, monitor from and to lists along with any other parameters not stored by the TNC to initialize it's operation. The CTEXT buffer is another 200 character buffer used for your personal connect message to the sending station when the program is in the autosave mode. The third 200 character buffer called ETEXT is used to send commands to the TNC when you return the computer to DOS so that connected info can be saved in the TNC until it is reconnected to the terminal. The 10 addition buffers of 140 characters each can be programed with connect paths for different stations in a network. All the buffers can be saved to disk and loaded from disk.

The Main text buffer can be used to create or edit text, store text for transmission, or hold incoming text copied while monitoring the network. The size of the buffer ranges from 22K in the model III to 30K in the model 4/4P/4D. The on line MENU provides help information on saving, loading and editing of text, plus a list of operating variables that can be changed by the operator. The operating variables include baudset, vidtime, Txline length, printer line length, retry and acknowledge on/off plus others.

During operation the top 2/3 of the screen displays the incoming text and the TNC output to the terminal. The single line divider is used to display program conditions in windows formed with parentheses. The lower 1/3 of the screen is used to display all text editing, command lines to the TNC or program and keyboard entered text during a contact. Two DOS commands, DIR :D and KILL FILE are available from the program along with a special RECVFILE/SENDFILE that allows transfer of any type disk files between stations using EZ-PACKET-80.

The manual is well written and covers all the operation of the program with the exception of how to save selected text stored on disk during autosave to a separate file. During autosave the program saves the received information in sections to one disk file. Upon loading the file into the text edit you will find only the first saved section yet, during the display mode all sections saved will be shown on the screen. By pressing the break key just as the desired section is loaded from disk for display you will stop the operation and the desired text will be found in the Main Text buffer. Now it can be saved to a different file or edited for retransmission etc. The only feature found missing in EZ-PACKET-80 was the date and time of day. Of course the accuracy of the computer's clock is not good, however, for the ROMPACK version of the program the clock in the ROM-116 could have been used.

Without exception this is the finest program I have used or seen for Packet on the TRS-80 model computers. One last feature that must be mentioned has to do with the approach taken by the publisher concerning copies of the program that find their way into the hands of a non owner. In the MENU there is a one time request, if you have received this program from another user and find it of value, your $20.00 contribution will be appreciated. In return an operation manual will be forwarded to you. When you consider that the program sells for $20.00 including shipping there is no real reason why you should not own your own copy and support the fine programming skills made available to the hobby of amateur radio.

Publisher: The Martin Co., PO Box 982, Marysville, WA 98270. Tel: (206)653-9596. $20.00.

- PRM -

A Bare Bones Dual-Port Digipeater

Frank Emens, W4HFU
3714 Lakewood Circle, Huntsville, AL 35811
(205) 852-0537 Compuserve ID: 72415,571

Realizing the inevitability of multiport digipeaters as a way to keep our fragile backbone packet links operating until the networking gurus get through bashing at each other and settle on a networking scheme, I downloaded a copy of KE3Z's description of his approach to a multiport digi. Although his approach solved the problem it was meant to solve very well, it seemed to me that the concept included more capability, and therefore more complication, than most of us will need. After some attempts to define the problem and a solution, I have arrived at the following concept. Some local hardware/software hackers are planning to implement the idea, so we would appreciate any comments & suggestions -- especially if you see some problem that will keep it from working.

THE PROBLEM: Most of us are in parts of the country that are just beginning to build up a packet radio infra-structure and have been able to learn from the pioneers. Therefore, most of us do not have the problem of interfacing several networks on different frequencies. We generally have digipeaters in key locations, usually population centers, which serve to tie the centers together. The digipeaters all are on a common frequency, usually 145.01. Around each digi there has evolveda de-facto local area network including all the local packet operators.

The obvious problem here is that multi-hop intercity traffic has to compete with the local traffic at each node of the network. The obvious solution is to move each local area network to a frequency other than 145.01 and leave the backbone network with nothing but long-haul traffic. Obvious solutions always seem to come with a flaw or two, and this one is no exception. The backbone network has no reason for existence if there is no convenient way to inject traffic into the system at a source city or accept incoming traffic at the destination city. Voluntary compliance to pleas to move off 145.01 to a local frequency will, quite reasonably, be nil if no interconnect to the backbone network is provided.

What we need then, is a device that will interface with a backbone network and a local network. The device should be able to serve the local network as a digipeater for those who can't communicate direct, it should be able to serve as a digipeater in the backbone network, it should keep local traffic and backbone traffic separate, allowing traffic to cross the barrier only if it is supposed to enter or exit the backbone network at its local area network. If possible, its existence should be transparent to both local and distant users, requiring no tricks with SSID numbers or special routing, and it should not do anything to the packet or its overhead not defined in AX.25. It should not depend on routing tables or anything else that would have to be updated to cope with changing conditions.

A SOLUTION: The above requirements can be met with a simple dual-port digipeater with the following routing algorithm:

The dual-port digi will have one port attached to a transceiver on the backbone network frequency and one port attached to a transceiver on the local network frequency. The digi will use the same call on each port. It will be capable of communicating with both ports simultaneously. Like any TNC, it must examine the routing sequence of every packet it hears. If the next uncancelled digipeater call in the packet's routing sequence matches the digi's programmed call, it must handle that packet. If there is another digipeater call in the routing sequence, the digi will output the packet on the backbone network, no matter which input port it was received on. If the digi's address is the last one in the packet's routing sequence, the digi will output the packet on the local network, again without regard for the port on which it was received

This restatement of the algorithm may be easier to follow:

```
If Packet_received_is_addressed_to_me then
     If There_is_another_digi_in_sequence then
          Output_packet_on_backbone_network
     Else
          Output_packet_on_local_network
     Endif
Else
     Do_nothing_with_the_packet
Endif
```

A few examples will illustrate the operation of this dual-port machine. Assume the local digi is W4DIG-1 and that Nextown, the next city on the backbone is served by W4REM-1. If I want to connect to K4AAA in Nextown, I fire up on our local network frequency and set up a connect request with "Connect K4AAA v W4DIG-1, W4REM-1". The local digipeater recognizes its call, sees that there is at least one more repeat specified in the routing string, and retransmits the packet on the backbone network. W4REM recognizes its call, sees that the routing string has been used up, and retransmits the packet on the Nextown local network, where we hope K4AAA is listening.

If I want to contact N4BBB, who is across town and out of my direct range, although still within reach of the local digi, I send a connect request on the local net frequency using "Connect N4BBB v W4DIG-1". The local digi recognizes its call, sees that the routing sequence is used up, and retransmits the packet on the local network to N4BBB.

As you can see, use of the system is automatic and transparent. All a local or remote user needs to know is that W4DIG-1 is the call of the digipeater serving this local area. The system should work whether the backbone network is 2-meters at 1200 baud or 1 1/4-meters at 9600 baud. If, as I hope they do, the networking gurus come up with a network scheme that "does its thing" with a smart box at the network level nodes and does not obsolete the installed base of TNC's, this dual-port digipeater will still be useful.

Let me know what you think.

- PRM -

Cactus Corner

Lyle Johnson, WA7GXD

Having spent much of the last two columns in space, it's time to get our feet on the ground once more. Last month I promised a look at the various TNCs on the market in the hopes of helping you decide which unit might best suit your needs.

Now, I am sure that I will step on quite a few toes, and I hope the various advertisers don't stop supporting PRM. Having said that, let's go for it.

Step one in deciding which TNC is for you, is deciding what you want to do on packet. Today, the most prevalent form of packet operation is ASCII text at 1200 baud AFSK on a 2 meter FM rig. 300 baud HF operation is rapidly gaining in popularity, especially on 40 and 20 meters.

Before the year is out, operation on JAS-1 and RUDAK should be fairly commonplace. While RUDAK will probably be more oriented toward gateway-style access, you may want to access JAS-1 from your home station on an individual basis.

9600 baud operation will be widespread within the next year and a half. I'm not speaking of networking paths (they should be running closer to 56,000 baud by then); I'm speaking of local area operation.

Consider for a moment. Present operation in a local area uses 1200 baud on radios that require around 200 milliseconds (or longer) to turn around. Listen to 145.01 MHz in much of the country. Listening is about all you can do for the congestion. If that activity were occuring at 9600 baud on radios that switched in 10 milliseconds, you could increase the channel capacity by a factor of 10 or more.

Of course, networking, alternate frequencies and other operational and technical advances will be occurring to change the packet landscape dramatically in the next year or two.

Now, place yourself in the picture. What do you want to do with packet over the next couple of years? Is 1200 baud operation the limit of your goals? If so, your choices are broad. If, on the other hand, you expect to be participating in faster networks, operating on HF or satellites, or being involved in the other myriad facets of packet that will be available, your choices become more limited.

Is portable operation a factor, or will you be doing all of your operating from your home? Would you like to try HF? What computer are you using in your shack now? Do you plan to change to another computer in the next couple of years? Are you already active on other digital modes (such as RTTY or AMTOR)? Do you plan on being active on those modes? Is your operation likely to be text-oriented only (like most packet operation today), or will you want to be involved in digital speech, binary file transfers, and the like?

The answers to these questions, and others like them, should guide you in your choice of a TNC. To assist you in matching your answers to hardware, I have compiled the following information on available packet controllers.

I will list the units with a very brief discussion of strengths and weaknesses. Please understand that any such comparison will be somewhat subjective. Also, note that while TAPR receives a small royalty ($3 to $5) per TNC-2 clone produced, I receive nothing personally. Thus, I have no stake in what unit you buy.

First, we will look at the two specialty controllers, then the general purpose units. Here goes...

GLB PK-1 and PK-1L.

Overview: These units are software-intensive, requiring the microprocessor (uP) to do all input and output (I/O) for the terminal and the radio channels on a bit by bit basis. They come fully assembled and tested. GLB has been marketing the PK-1 since 1983. Price class is $110-$160.

Strengths: Units operate from 12 vdc. PK-1L draws under 25 mA. Baudot adapter available for interfacing to older RTTY gear.

Weaknesses: If a character is typed at the keyboard when a packet is being sent or received, the packet is trashed. No built-in watchdog for unattended (eg, digipeater) operation, although one is available as an accessory. No indicators (eg, LEDs) to tell what the unit, or the channel, is doing. 2400 baud maximum on HDLC (radio) port. No modem disconnect or easy means of attaching a better modem for satellite or high-speed operation. RS-232 interface switches between GND and plus 12 volts only. Callsign must be burned into EPROM at time of ordering or manually entered every time the unit is powered up.

AEA PK-64.

Overview: A dedicated accessory for a Commodore 64 computer (or C-128 in C-64 emulation mode). Menu-driven interface. Operates all digital modes (CW, RTTY, ASCII, AMTOR, Packet). Fully assembled and tested. Marketed since 1985. Price class $220. HF modem option $100.

Strengths: Easy to interface to C-64. All software built-in for split-screen operation. First all-mode digital controller. Hardware HDLC port may allow future operation at higher speeds.

Weaknesses: Dedicated terminal interface may limit usefulness for non-text communications. Unit is only useable with Commodore 64 and 128 computers. 40 character display width limit.

TNC-1, Heath HD-4040, AEA PKT-1

Overview: These units are based on the TAPR TNC kit, first marketed in 1983. Heath unit is a kit, comes with status indicator, is AC powered and sells for $200. AEA version has +12 vdc power supply, is fully assembled and sells in the $500 range.

More >>>

Strengths: Standard modem disconnect for satellite and higher-speed operation. Software selectable baud rates for terminal and radio ports. Parallel port for expansion/status/testing. Two banks of non-volatile user storage of callsign, timing and other parameters. Standard command interface. True RS-232 interface levels. All ports full duplex. Tuning indicator connector for HF use (compatible with TAPR tuning indicator). Watchdog timer on radio port for compliance with regulations for unattended operation. On-board modem configurable via plug-in headers.

Weaknesses: Support for AX.25 V 2.0 and multiple connects only available from third-party source (uses non-standard command interface). Physically larger than other units. 6551 UART in terminal interface has a bug with hardware flow control.

Kantronics Packet Communicator

Overview: A compact unit that features an AMD7910 modem, comes fully assembled and costs about $220. The KPC was first marketed in 1985, and the successor version, KPC-2, appeared in 1986.

Strengths: Uses standard command set. Operates on +12 v power. True RS232 interface levels. Modem tones software selectable for 300 baud HF as well as 1200 baud VHF use. TTL interface selectable for Commodore computers. AX.25 V 2.0 supported. Multiple connects supported. Non-volatile memory stores callsign and other parameters.

Weaknesses: Software HDLC port limits data rates for future use. No modem disconnect. HF modem uses different tone pair than most others, resulting in a differnet frequency display. Modem does not lend itself to tuning indicator for HF. No watchdog timer for unattended digipeating or other operation.

TAPR TNC 2, AEA PK-80, Pac-Comm TNC-200, GLB TNC-2A, MFJ-1270

Overview: The TNC 2 was designed to reduce the cost of entry into packet without sacrificing performance or features. It has been marketed since 1985. All versions are compact in size. AEA version is assembled for $220. GLB offers a kit for $155 (NMOS) or $170 (CMOS). MFJ unit is assembled for $129. Pac-Comm offers bare boards ($39), kits ($130-$170) as well as assembled ($200-220).

Strengths:

Hardware HDLC supports 9600 baud rates on radio port. Standard modem disconnect. On-board modem configurable via plug-in headers. CMOS versions draw 100 mA. All units run on +12 volts. True RS232 interface levels. (MFJ unit also has TTL interface for Commodore computers.) LED indicators provide status of unit and packet channel. Watchdog timer for compliance with unattended operation. Software available for true network switching. AX.25 V 2.0 supported. Multiple connects supported. Standard user interface. Extensive documentation in fully-indexed manuals. Large non-volatile memory stores operating parameters and callsign. Modem connector interfaces to TAPR HF tuning indicator.

Weaknesses: Radio and serial port data rates set by DIPswitch. Some early units generated hash on HF.

Moving On

There are a few other units available in the marketplace. Since I have no direct experience with them, the following is based on observation and hearsay only.

IBM PC Cards:

The Hamilton, Ontario, packet group has a card that plugs into the IBM PC. It supports V1, V2 and AX.25 protocols. It is based on the Intel 8273 HDLC chip, includes an on-board XR2206/2211 modem, and sells for $75 bare board or $200 assembled.

AMRAD has developed a plug-in card using an 8530 SCC. It contains two channels of HDLC, a pair of 7910 modems, and will be available from PacComm in the summer.

Other TNCs:

GLB showed the PK-2 at Dayton. This is based on the Z80 and 8530 chips, features the TAPR as well as GLB commands sets, a plug-in modem based on the 7910, and can control their new 9600 baud radio directly. It sells assembled for $249 and should be available this summer.

Packeterm makes the IPT, a terminal with integral packet controller. The packet controller is based on the TNC 1 design, but uses a 7910 modem. The unit runs on +12 vdc and sells for $1,000.

Lockhart Technologies makes the TNC+ kit, a unit based on the earlier VADCG TNC of the late 1970s. It sells in the $200 price range. It includes no onboard modem nor cabinet.

AEA announced their new PK-232 TNCs at Dayton, with availability projected during the summer. These are multi-mode units, offering CW, ASCII, RTTY and AMTOR in addition to packet operation. One version includes an internal modem, while the other is for use with external modems only. Pricing information is not yet available.

Ashby and Son sells a version of the orignial VADCG TNC. It is smaller, includes no modem, and sells assembled (but wihout cabinet) for about $250.

That pretty well wraps up the TNC marketplace at this time. I hope this information is helpful for you. I haven't included addresses for any of the various manufacturers, but most advertise here in PRM.

Three final notes for the HF operator. At Dayton, TAPR released an HF tuning indicator kit. It works with all TNC 1 and TNC 2 clones, and most other TNCs that utilize the XR2206/XR2211 modem chip set. See PSRQ for October, 1985 for details on the circuitry used. It is only $25.

Amateur Packet Alaska sells a switch and PC board kit that installs in any TNC 1 or TNC 2. It provides a front panel switch to select HF or VHF modem operation. It sells for $30.

Continued on page 13 >>

Computer Networks

Rollins Turner

Packet radio networks differ from all previous forms of radio communication by making use of computers to control communication. Packet radio nets are, in fact, computer networks. While an understanding of computer networks is not essential to effective use of a packet net station, many amateurs have a natural desire to understand how things work. This article provides a peek inside the black box of computer networks.

Computer networks are generally described, and indeed built, as layered structures. Each layer provides a certain set of services to higher level "users", while being itself a user of services provided by lower levels. There are a number of reasons that computer networks are designed this way. Perhaps the most important is that this is simply what computer engineers consider good design practice. It permits them to limit the complexity of each component of the system, and to design various parts without being concerned with internal details of other parts.

Computer networks differ in the design of each layer, and even in the exact location of certain functions. The general concept of layering is, however, common to practically all networks. There is a fair amount of agreement among different networks as to the functions of the lower levels, which we will discuss here.

The First Four Layers

The first, and most basic, layer is the physical communications layer. The service provided by this layer is the transmission of information between geographically separate points. The second layer is called the data link layer. Its major function is to handle errors introduced by noise and interference in physical transmission. It also adds some structure to the raw data stream provided by the physical level. The third layer is called the network layer. The network layer is necessary only when not all stations can communicate directly with each other. Its major junction is to forward packets on behalf of stations that cannot communicate directly with their destinations. The fourth layer is the transport layer. While the first three layers operate at each hop along a packet's path, transport operates only at the source and destination. Transport provides a reliable, end to end communications service for network users. It permits multiple simultaneous conversations to be in progress at a single network station without interfering with each other. And it provides for the orderly establishment and termination of these conversations.

The Physical Communications Level

Let's look in more detail at the physical communications layer. The function of this layer is simply to transfer information from one point to another. One of the major issues at this level is how to represent the information to be transmitted in the transmission medium. Hams are accustomed to transmitting voice information by various modulation techniques and text by off-on keying. Computers exchange information with each other only in the form of binary coding -- long strings of ones and zeroes. It might seem natural to use off-on keying to represent binary information, but this is not the usual technique.

For a number of years, telephone links have been used to permit computers to communicate with terminals and with other computers. In order to use the telephone system to transfer binary information, we have to represent the ones and zeros in terms of audio tones. Ones are represented by an audio tone of one frequency and zeroes by an audio tone of a different frequency. Internally, computers and terminals typically represent ones and zeros by different DC voltage levels. Computers and terminals are connected to telephone lines through devices called modems, which convert information from the internal DC form to the audio frequency tones needed by the telephone system and vice versa.

When hams started looking at the possibility of using radio for packet communications, radio equipment for voice communication was readily available, and it was functionally similar to telephone equipment. The modems to connect computers to phone lines were readily available. The obvious solution to representing binary information on radio was to combine these two pieces of readily available equipment. Modems accept the DC voltage level representation of ones and zeros from the computer and produce an audio signal that represents ones and zeroes as different tones. This audio signal is connected to a transmitter in the place of a microphone, and the transmitter happily transmits the ones and zeros just as if it were transmitting a normal human voice. The results sound a little strange to anyone who happens to be listening, but they make perfectly good sense to another packet station. The received audio signal is passed to a modem that converts it back into the DC voltage levels representing ones and zeroes. This signal is fed to the computer at the receiving end, which never needs to know that it was not communicating directly with another computer or terminal.

The Data Link Level

The physical communications level provides us with the ability to transmit a string of bits from one point to another, but it does not guarantee that the bits received will be the same as the bits sent. It also does not tell us anything about how to interpret the bits -- how to tell an address from a message, for example. When several stations all share the same frequency, the physical layer does not provide any control over which one can transmit at a given time. Solving all of these problems is the responsibility of the data link level.

Computers communicate with each other with packets of information having a known structure. A packet, or frame, normally begins with a header, which has a specific format and provides information about the packet. Header information might include a code identifying the packet as one of several possible types, a sequence number, and an address specifying

More >>>

the intended recipient. The first problem faced by the data link layer is to decide where a packet begins. This task is called framing.

The most commonly used technique for framing is to use a special bit pattern to signify the begining of a frame. This pattern, called the flag sequence, appears at the beginning and end of each frame and serves to slice up an unstructured stream of bits into distinct frames.

A major function of the data link level is to detect transmission errors. It is not unusual for a frame to be received with one or more bits reversed from the values that were sent. It is easy for computers to detect these transmission errors and to arrange for the flawed packet to be retransmitted. At the end of each packet, the sending station appends a sequence of bits called a frame check sequence. This sequence of bits is computed from the values of the bits that make up the rest of the packet. At the receiving end, the computer recomputes the frame check sequence from the bits that it received and compares the result to the frame check sequence that it received. The rules for computing the frame check sequence are designed so that it is virtually certain that if any errors occur in transmission, the frame check sequence computed by the receiver will differ from that which it receives in the packet. This allows the receiver to know that something is wrong with the received packet.

When a station receives a packet correctly, it sends an acknowledgement packet to the sender. If the receiver detectrror in a received packet it does not send the acknowledgement. The sender expects to get an acknowledgement packet shortly after sending a packet. If it does not receive the acknowledgement within a reasonable amount of time, it retransmits the message.

It is common in many forms of computer networks, including radio nets, for a number of stations to share the use of a single communications channel. With a shared channel, some technique is needed to determine which station can transmit at a given time. This function is called access control. The most widely used technique in radio nets is called Carrier Sense Multiple Access, or CSMA. CSMA can be summarized as "listen before talking". A station with a packet to send is required to listen to the channel prior to transmitting. If any other station is transmitting, the would-be sender must wait. If it finds the channel unused, it is free to start transmitting.

Obviously there is some chance that two stations will listen at about the same time, both sense the channel free, and both start to transmit. In this case both messages will probably be garbled, and neither receiver will send an acknowledgement. If each station were programmed to wait for a certain amount of time and then retransmit, the same scenario could be repeated indefinitely. In order to avoid that problem, a station that does not receive an acknowledgement is required to wait for a random amount of time before retransmitting.

The physical layer and the data link layer together provide everything we need to create a very limited computer network. In early computer networks, this is all there was. Higher layers build on the functions provided by these layers to provide more sophisticated forms of service to their users. We will take a look at these higher level functions next month.

Rollins Turner is the principal consultant of System Performance Analysis, Inc., in Tampa. For the past three years he served on the faculty of the Department of Computer Science and Engineering at the University of South Florida, where he taught graduate courses in Computer Networks, Computer Architecture, and Modeling Computer System Performance. From 1970 through 1983 he was on the staff of Digital Equipment Corporation. He holds a PhD in Computer Engineering from the University of Massachusetts, Amherst.

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THE FOLLOWING FROM THE KOHOA PBBS:

WILLIAM D. McCAA Jr., KORZ
POST OFFICE BOX 3214
BOULDER, COLORADO 80307

Review of the AEA HF Packet Modem, Model PM-1

If you are like me, you have tried your TNC on HF 300 baud packet with limited success. I even tried using the recommended filter for 300 baud operation and found that the situation was improved but it still took a rock solid signal to be able to ext introduced their model PM-1 Packet Modem. It is a modem that goes between the HF rig and any packet TNC and requires no modifications of the TNC. Basically it has two separate built in demodulators that each feature channel filtering and A.M. detection for maximum sensitivity and selectivity under noisy HF band conditions. The HF receiver tuning is assisted by a front panel bar graph. The PM-1 also has a built in Bell type 202 modem which allows for the direct connection to the audio input awwhich allow for the direct connection to the microphone jack of the HF SSB rig.

I was able to purchase a PM-1 locally, s/n 46, to try its operation on HF with my TAPR TNC-2. The installation was quite easy, just solder a few connectors to the cables provided and I was all set. I don't quite know how to put into words the surprise I experienced with the improvement, but the first BBS signal I found in 20 meters was WORLI. I connected to Hank's BBS and operated it just as easily as I operation, for I have never been able to maintain a solid connect on HF with any station, let alone a BBS, without a lot of effort and retries. Now that I have had a few days of operation with the PM-1, I find I am able maintain packet connects with a minimun of retries with signals that are fading, weak, and noisy. The copyability is just as good as with the best of the RTTY Terminal units I have used. The PM-1 has opened a whole new world of pleasurable HF packet operation that I have never kno have or planning HF packet operation, I strongly recommend you look into the AEA PM-1 for use with your TNC.

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FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION

Bytes From The Write Only Memory

Ted Huf, K4NTA

Joel, KI4T, in Miami is working on a system where hams would report current weather data direct to the National Hurricane Center (HNC) via packet radio. Joel tells me that one big problem that the NHC has when trying to use weather observations from the public is determining their accuracy. One way to overcome the inaccuracy of the observations is to read calibrated weather instruments via a computer and transmit those readings direct over packet. I think Joel would like to have some help to work out a packet radio interface to these calibrated weather instruments. The interface might be a small personal computer like the Model 100 or C-64. It should be either battery operated or backed up with a battery. Operation would be automatic with either the remote weather station sending the data to the Hurricane Center on a periodic basis or by the Center polling the remote station. Another thought is to have a packet station in Miami collect all the data and pass it on to the NHC when requested. There is a nice opportunity here for someone to get into some hardware and software design. Any takers?

On Sunday, May 19th there was a meeting of the Southern section of the Florida Network Coordination Committee at Clewiston. Reports were given on KE3Z dual port digipeater software and modifications required to the Xerox 820/FAD Board and the TNC-2 to permit the dual port software to run on them.

It was also reported that Howie, N2WX, is rewriting the GATOR 2 software and that it could be sometime before GATOR 2 was ready for dual port operation. Because of the delay on the dual port GATOR 2 software, it was decided to go with the dual port digipeater code and get our 220 mhz network going as soon as possible.

Ever since BBS systems started showing up on packet radio there has been talk about the interference caused by the BBS operation. Much has been said about getting the BBSs off of 145.01. When this started coming up a lot last year I took the position that we would try to keep the WORLI type MailBoxes from doing their forwarding during prime time, or about 1800-2300, but that the MailBoxes had to stay on 145.01 because that was where the digipeaters were. Without networking or at least an alternate string of digipeaters, the MailBoxes could not do their job. I still think that I am right in this position.

We are still some time away from having a linked network of GATOR 2 switches using level 3 protocol. We are much closer to dual port digipeaters that will help relieve the loading on .01 but it could be a couple of months before we have enough dual port digis in place to help much. In many areas the amount of traffic just for QSOs makes if difficult to talk more than one LAN away and if you add the traffic caused my the BBSs, it is difficult to talk across town at certain times.

My proposal is simple. If an area has this problem because the activity is high, their should be enough packeteers in the area to support another digipeater. This digipeater would go on another two meter frequency, one which has been cleared by the Packet Frequency Coordinating committee, and all the BBS operators would be asked to move over to that frequency. The PFCC was asked for such a frequency that could be used just in the Southeast part of the State. Where the alternate digipeater network ends, a WORLI MailBox could operate using two ports, one on 145.01 and the other on the alternate frequency.

The plan is to set up an alternate digipeater from Miami to Stuart on 145.03. 145.01 will be cleared of BBSs from Miami to Stuart except for the WORLI MailBox in Stuart which operates on 145.01 and 145.03 so that it can forward messages to N2WX-1 in Melbourne. The 145.01 port on K4NTA would be configured so that only other MailBoxes would be allowed to use 145.01.

I would like to point out the this idea is not new and that Jim, K4AHO, has operated his MailBox on 145.01 and 145.05 for sometime and that there is a 145.05 digipeater in Orlando. This plan is with the understanding that it should do nothing to slow down the development of linking on 220 Mhz and that the entire alternate network might have to be torn down to make way for the real network. We hope to have it in operation by the time that you read this.

Phil, KA4NOF, who has provided the WORLI MailBox for the West Palm Beach area for some time has been plagued with equipment trouble. He now seems to have hardware problems on his 820 computer board which has put him out of service. Frank, KB7TV-1, has stepped in to fill the gap with his IBM AT and 30 meg fixed disk system. Boy, some step up from the Xerox 820 ?EH. Frank has his MailBox available at all times on 145.01 and on HF when ever he is home.

Joe, WD4KAV, has been off of the air a lot lately. Joe and XYL Jean, WA4SMZ, have purchased a new house in Port St. Lucie and will be moving soon. Watch for Joe to have a Xerox 820 WORLI MailBox on the air soon from the new QTH. Joe tells me that he will still try to have programs for the C-64 to download even though the host system is no longer a C-64.

Beginning with the June issue of PRM, yours truly will be editing the FADCA>BEACON portion of the magazine. Please help me by sending along your items of interest for inclusion in the BEACON.

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The FADCA Network Coordinating Committee Meeting
May 18, 1986, Clewiston, FL

Don Deem, KB4LLO

On Sunday, May 18, 1986, Packeteers from all over the southern half of Florida, began to fill the parking lot of Tony's Glades Restaurant in Clewiston, Florida. The purpose was to discuss the progress that we are making with the 220 Mhz networking project often referred to as the Gator 1/2 network. For those of you who have not had the pleasure of visiting Clewiston, check your map and you will find Clewiston located on the southwest side of Lake Okeechobee, right on U.S. 27.

Tom Kneisel, K4GFG, chaired the meeting and began by explaining that due to the extreme length of our state, we had decided to divide the state into three groups; the northern half, the southern half, and the panhandle. The southern group is co-chaired by K4GFG and Don, KB4LLO. The northern group is chaired by Jim Diggs, K4AHO. At present we are looking for a volunteer to head the panhandle group. This will be the first meeting since the division. The other groups will inform us when they have their meetings set.

Tom took a moment to thank Tony, and his staff at the Glades Restaurant, for providing us with such a fine meeting place.The service was great, I don't think my ice tea ran out even once! Thanks again Tony.

We then discussed the topics that we felt should be covered at this meeting. It was decided that we would begin with a status report on the network switches. The following is a condensed version of that reporting.

BCR - In construction, will be ready in about 60 days
CLW - Completed, being used for software development
FTL - No plans for linking at present
HWD - Finished, awaiting software
HST - No equipment/plans at this time
MLB - Unknown, no representative at meeting
MIA - No 820 hardware, plan to go TNC-200 software route
HLO - Secondary (Miami) digi, no plan at this time
NAP - Unknown, no representative at meeting
ORL - No plan as yet, but some equipment
PTC - Tested and ready since November 85
SRQ - In work, 60 days to completion
STU - Need antenna and software to complete
TPA - 820 system in work, approx. 60 days to complete
WPB - 820 board problems, no estimate on completion
PMB - No completion date

It was suggested that we have our next meeting August 24, 1986 here in Clewiston at Tony's. A second was heard, and all agreed. At this point the discussion was guided to one of our major issues to discuss today, SOFTWARE. Howie, N2WX, was unable to attend but sent us a message to inform us of his progress with the code he is working on for us. It appears that a rewrite of the old code was not practical, and as a result Howie has decided to start at the beginning and develop a more concise and practical code for the network switches that we are about to use in our 220 Mhz network. In the process he is preparing the new code in such a way as to make it easy to modify it for other types of equipment.

For those of you who don't know Howard Goldstein, N2WX, I want to take a moment to tell you a little about him. Howard lives in the Palm Bay area on the east coast of Florida. I understand that he has one or more jobs at present, and is a student at the same time. Even with this workload he still finds time to develop software for us. A few of his accomplishments include software for the TNC-2, the FAD PAD, and network switches. Not bad when you consider that most of us have trouble putting batteries into our watches. Thanks Howie for those hours you have given us.

For those of you that are interested in helping Howie develop software, assuming that you have the necessary training, drop Howie a message on the bbs system, he would appreciate some help.

Bill Bard, N4IXI, was called upon to report his progress with modification of the KE3Z code. Bill reported that his modification of the code was almost complete, and that he had done some testing. The results of that testing indicate that he has one problem with the receive modem side, but that the transmit side appears to work well. His plans call for continued testing for the next few weeks to define and resolve the modem problem. He feels that his primary effort will be completed in about 30 days. Bill indicated that he would like to see a copy of the work done by the California group before he finishes his modification to insure that there will be compatibility between the two modified codes.

Bill, WD4JKM, and Tom, K4GFG, then brought to the attention of the group the work being done by the California packeteers to permit a TNC-2 to be used as a dual port switch, using a modification of the KE3Z code. Bill indicated that there was a hardware addition to the TNC-2 to enable it to be used as a dual port switch. He is writing to California for more information and will provide this data to those interested.

At this point there was considerable discussion of the two methods presented. Ted Huf, K4NTA, moved that since the two methods were compatible, that we all come on line ASAP with whatever hardware/software approach best suited our situation. His motion was seconded, and passed with total agreement of those in attendance.

Tom, K4GFG, brought to our attention the coordination that will be required when we start to convert our digi's to switches. The frequency coordinating committee has already developed a plan that will assign LAN frequencies, resulting in minimum interference between LANS.

There was discussion about allowing or not allowing individuals to operate on the backbone frequency. It was moved and seconded and unanimously

More >>>

agreed that we have a policy NOT permitting individual operation on the 220 backbone frequency.

The next topic discussed was 220 IDs. This twenty minute debate was concluded when a motion was made and seconded, that we use call signs only without the /A or /N. This was not a unanimous vote, but passed substantially.

Ted Huf K4NTA, presented a proposal designed to reduce the traffic on 01 by establishing an alternate frequency on two meters for digipeaters between Stuart and Miami. This plan would require the temporary relocation of all BBS systems to the new frequency. This new network would only exist until the 220 network becomes a reality, then would disappear. In other words, this is a stopgap plan to provide immediate relief of congestion presently on 01. The frequency selected was 145.03. Ted's plan was favorably accepted by the committee. It was decided to approve the plan as stated, and allow those involved to work out the details among themselves.

The subject of beacons was discussed again. The committee decided to STRONGLY suggest that unnecessary beacons be eliminated. Unattended beacons, and beacons sent at a high repetition rates are to be discouraged, and will be considered to be in bad taste.

I would like to take this opportunity to thank those who attended for joining us. I would especially like to thank my co-chairman, Tom Kneisel K4GFG for chairing this meeting, one of the best we've had yet.

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Proposed Packet Frequency Plan for Florida

Tom Kneisel, K4GFG

FADCA's Packet Frequency Coordinating Committee met on May 18, in Clewiston, Fla. K4NTA, WB4KGY, and K4GFG were in attendance.

WB4KGY (our FRC liason and frequency coordinator) reviewed the 10 digipeater registration forms that have been returned to FADCA so far. It was noted that key information such as latitude and longitude, antenna height, ERP, and coverage was missing from some of them. The PFCC will follow up with the individual trustees to obtain the information. Those who have not yet returned their forms should do so as soon as possible.

The status of frequency requests for other bands was reviewed. No action has been taken pending return of their registration forms. W4APV suggested three frequencies be considered for 6m packet operation: 53.490, 53.530, and 53.510 Mhz. The PTC and TPA groups reported that they plan to do some linking of their BBSs on 220 Mhz.

The frequency assignment plan for 2m digipeaters was discussed and approved. It is shown below.

K4NTA presented a proposal to establish an alternate digipeater network between Stuart and Miami. This network will use digipeaters that are either already in place or that will be established shortly. The PFCC approved the temporary use of 145.03 Mhz for this purpose. BBS's may qsy to this frequency leaving 145.01 free for local and long distance ragchews.

The next meeting of the PFCC in the south of Florida will be at 10 am on August 24 at the Glades Restaurant in Clewiston.

Proposed 2m Packet Frequency Plan for Florida

145.01	Pompano Beach, Ft. Lauderdale, Miami
145.03	Ocala, Port Charlotte, West Palm Beach
145.05	Crestview, Lake City, Daytona, Tampa, Stuart, Naples
145.07	Tallahassee, Jacksonville, Clearwater, Boca Raton
145.09	Gainesville, Melbourne, Sarasota, Homestead

Temporary: Miami 145.03, Orlando 145.03, 145.07, Jacksonville 145.03, Sebring 145.05, Hollywood 145.05

Notes:

1. The minimum co-channel spacing allowed was about 115 miles.

2. The temporary assignments permit some co-channel spacings to be considerably less than 115 miles. These digis will be re-located as soon as more packet frequencies become available on the 2m band.

3. 145.01 is intended to remain the primary frequency for non auxiliary linked digipeaters. No minimum co-channel separation will be guaranteed. Any existing digis who wish may stay on 145.01. New digis may freely load 145.01 Mhz.

4. This list represents frequencies that will be made available in or near the cities listed. The frequencies have not been reserved for any particular digipeaters. Digipeater trustees should choose a frequency in accordance with this plan and then notify the PFCC WHEN THEY ARE READY TO OCCUPY IT. Unless otherwise agreed upon by the trustees involved, it is assumed that only one digipeater will utilize the assigned frequency in a given area.

5. The cities listed serve as an approximate guide only, and the exact digipeater location may vary considerably, subject to certain restraints such as separation from co-channel digis or 30 mile separation from adjacent channel voice repeaters.

6. If a frequency is not loaded within a reasonable time, it may be reassigned to another trustee or city even a considerable distance removed.

7. FADCA PFCC welcomes comments on this plan. Send them to the PFCC at the FADCA address. If no modifications are adopted on or before August 24, the plan will become final at that time.

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SAN DIEGO PACKET RADIO GETS ORGANIZED

Date: 23 May 1986
Distribution: Open
From: Paul Williamson, KB5MU
Subject: San Diego Packet Radio Association

The San Diego Packet Radio Association (SANDPAC) was formed on May 21, 1986. This organization formalizes the long-standing San Diego Packet Group. The purposes remain unchanged: To improve the state of the art, encourage and educate interested persons, and above all to promote and build the local and worldwide networks for digital communication via Amateur Radio.

The initial officers will serve until the end of the year:

President:	Paul Williamson, KB5MU
Executive Vice Pres:	Ken McGuire, WA2VFN
Technical Vice Pres:	Mike Brock, WB6HHV
Treasurer:	Bill Calderwood, K1CT
Secretary:	Bill Johnson, WD6FPY
Director at Large:	Barry Gershenfeld, WA2QMI
Director at Large:	Tom Lafleur, KA6IQA

Persons interested in joining SANDPAC should contact the secretary for information and a membership application.

- PRM -

NEW *** PAK-COMM *** NEW

The PAK-COMM program is written for packet radio terminal controllers. The program enables the operator to enjoy the uses that packet radio offers by taking care of the housekeeping, and provides the little 'extras' that make daily operations easy. Use PAK-COMM for both modem and packet work.

Com Parameters: 300-9600 bps, set port, parity, data bits. A start-up file with pre-defined communication parameters, file transfer protocols, date/time stamp options, operator identification line and space for command macros. Set up many files, pick at run time.

Scrolling Pages: Five pages of receive screen with full cursor control.

Split Screens: Separate transmit and receive screens with full line buffering for the transmit. This will enable you to monitor all channel activity while composing messages. Set split where you wish.

File Transfers: You may use transparent or x-modem protocol. Constant character count is provided to monitor activity.

Command Macros: The Alt function keys are available to send strings of up to 250 characters or timing loops that are sent to the controller in one keystroke. Setup complex rpt chains or BBS logons.

Help Screens: Two individual help screens are available. one is a text file to be modified by the user. A good place for system maps.

And Lots More: **Like 5 different date/time formats, operator identification line, log files, 50 page manual and even MORE !**

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RMPRA > PACKET

A NEWSLETTER OF THE ROCKY MOUNTAIN PACKET RADIO ASSOCIATION

DATELINE: THE CONTINENTAL DIVIDE

Bob Gobrick, WA6ERB
President, RMPRA

Packet radio this past month in the Rocky Mountains has reached some exciting new heights (figuratively and literally). Some "height" lights follow:

The Golden Spike: In the spirit of the great Western frontiersman the packeteers of the RMPRA have charted the way for the first digi path across the Continental Divide. The Front Range (Pueblo - Denver - Cheyenne) is now reliably linked to the Western Slope (Aspen - Grand Junction - Rifle). With the help of our ARRL section manager -Bill KQOJ, and packeteers on both sides of the Divide (Eagle County Ham Operators, NOBRI, WOKEA, WORSG, KOGUZ, KCOGU, etc.) the Golden Spike has been set (set, but not driven - we still need help from the Flat Landers in Kansas and Nebraska and the Canyonlanders in Utah to really achieve the goal - the RMPRA offers a Challenge - Official RMPRA Golden Spike Awards for the packeteers who complete the paths East and West from the Rocky Mountains).

RMPRA Packetfest - The second annual Rocky Mountain Packetfest was graciously hosted by the Honeywell Ham Radio Club in Littleton, CO. With over 50 packeteers in attendance from 4 states, the event was capped by the presence of the infamous(?) guest speaker Packet Pete Eaton WB9FLW, Executive VPM of TAPR. Pete auditioned his new MTV Packet Primer video (a real nice beginners video funded by TAPR). There were a host of the other speakers including KOZCO, NOCCZ, KOGUZ, KB6QL, KAOCZW, KOVLD, KCOQJ, WA6ERB, and topics ranged from PBBS's to future use of telephone area codes for traffic routing. A good time had by all and wait until you see next year's RMPRA Packetfest.

Elections: The Packetfest culminated with this years election of new Board of Directors members and a new slate of Officers. They are President: Bob Gobrick WA6ERB, Vice President: Norm Miller NOENN, Secretary: Linc Haymaker KOZCO, Treasurer: Don Brown NOBRZ, BOD's Andy Freeborn NOCCZ, Sam Selder WOHJX, Bob Johnson KA7DXJ and Chris Kelly WD5IBS. A hearty thanks for outgoing officer John Conner, WDOFHG and all those who ran on the ballot. We hope to expand the Organization this coming year with a number of technical and management committee appointments. Remember: Uncle Rocky needs your help and we will actively solicit volunteers.

Maps: The RMPRA lead scout cartographers have really been knocking out the maps - Ole, KCORL charts the Colorado wilderness with what seems to be updates every two weeks and KD7AN has joined the expedition with a new "KCORL" type map of Wyoming. A New Mexico map should be added soon now that links are opening up into Albuquerque and White Sands.

PBBS Software: Everyone is waiting for the 11.6 release of the Hank's WORLI PBBS software and I hear there are some neat features included. Dave, KOHOA will handle distribution for the RMPRA. The Rocky Mountain group also has eight WA7MBL Beta PBBS's in operation, powered by horses ranging from the IBM AT to an oat fed supercharged Taiwan clone. Everyone awaits Jeff's (WA7MBL) next offering. Bob, WA6ERB also has for RMPRA distribution Jon's WB2MNF new PBBS Sysops Manual.

Personal Mailboxes: Recent digital exchanges with Jon, WB2MNL on Compuserve (Scott, W3VS great HamNet section) discussed Jon's drive for developing personal mailboxes that will link to the WORLI and WA7MBL PBBS systems. Bill KORZ of Boulder, Colorado has had a Tandy Model 100 lap computer on the air for the past two months acting as a mini PBBS for personal mail. The software was developed by Dick, N1AED (obtained from Compuserve HamNet or the April 86 QST On-Line section) and it has proved to be very reliable. In addition to making a compact and portable PBBS for emergencies the use of the private mailbox concept clears up the backlog of messages that build up on the Node Gateway PBBS's. I think we would all like to see some development of similar software for other low cost computers (since a lot of us leave our rigs and TNC's on full time it shouldn't be too much of an addition to keep a mailbox computer on line). There has also been a strong growth of RMPRA packeteers packaging up Model 100's and Brother EP-44 smart typewriters for portable stations. Over a dozen such systems exist in the region.

Rocky Mountain Hamfests: Just about every Rocky Mountain Hamfest during the last two months has had RMPRA booths cranking out public relations along with packets. The Pikes Peak ARC group in Colorado Springs had a novel Hamfest location situated in a local indoor shopping mall. It was a great success for the PPARC as well as the RMPRA. The PR to both the Ham and non-Ham public was tremendous (it does become expensive though if you bring your spouse along to do some shopping while you're playing packet radio).

Packet Product Reviews: The second issue of the quarterly RMPRA > Packet Newsletter contained a number of Packet Product Reviews on the Amateur Packet Alaska VHF/HF switch, PAK-COM software for MS-DOS Packet terminals and other mini reviews. We are looking for future reviews (upcoming AEA PM-1 HF Packet Modem review) so please submit your material by Pony Express or packet to Bob WA6ERB. If Gwyn can fit them in they may be included in future issues of the Packet Radio Magazine.

That's about it for this month out in the Wild West. If you want to be were the packet action is in the Rocky Mountain area, we of the RMPRA encourage you

Continued on page 13 >>

SOUTHNET

Eric Ellison, N4CI

I currently do not hold any official post in any packet organization. I am not a SOUTHNET Committee member. I do not operate a BBS or a digipeter. This is not by happenstance but because I wanted to devote more time to NNC development and other experiments. I guess you could say I am unbiased. WOW! What an I gonna do with all this spare time? I am still 99% devoted to packet radio development (1% for CW). Being one of the conceptual founders of GRAPES and SOUTHNET I still have a very firm belief in the LAN/state/regional/(national?) organization concept to help guide networking. I would like to volunteer to edit the SOUTHNET column for PRM. Regardless, I intend to submit material to be considered for publication under a SOUTHNET banner each month. Gwyn cannot do all for everyone and some editing is in order.

WHERE DID SOUTHNET GO?

As anyone who went to Orlando knows SOUTHNET Committee was present in force but not in organization. Why? Simply because too much was going on in conflict with an organized approach to SOUTHNET meetings. This is not anyone's fault. Most of the key folks in packet radio are involved in so many aspects that there comes a point where not everything can be done at once. Communications in this day of hi-tech communications is still very difficult on a regional basis. Schedules get bombed. Not everyone can use Compuserve. Packet has not evolved quite enough to get rapid communications up and down the pipe and telephone calls are expensive. So in short we will still have to use printed material to inform the masses and the committee. PRM is a very good and healthy start towards centralized communication.

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WHAT IS SOUTHNET?

SOUTHNET is a loose organization of states within the region who are bound together by a common interest in packet radio. The states currently in SOUTHNET are Alabama, Georgia, Florida, Mississippi, and South Carolina. SOUTHNET Committee is a committee of 2 representatives from each member state appointed or elected from that state. They, ideally should be among the best informed about packet radio concepts and progress in the state. Who are these committee members for 1986? Well, I sure do not know. Please tell me. Write to me, call me. Drop me a message on DRNET. Somehow get me the info. Please include Name, Call, Address, and Phone number. There is no official charter or rules for SOUTHNET but a number of loose agreements have been made at the first three SOUTHNET Conferences. There is no reason why sections of states could not be included, for instance East Tennessee and the Southern half of North Carolina. The boundries should be logical rather than political. It was recently reported to me that 2 areas in Tennessee wanted to be included as LANs in the GRAPES system of LAN coordination/coordinators. At least for the time being this makes good sense since they do not currently have a statewide organization and they are boardered by the North Georgia Lan.

WHERE HAVE WE BEEN?

The first SOUTHNET Conference was sponsored by FADCA and held in Gainesville FL in June of 1985. The format was presentations in 3 simultaneous sessions on all levels of packet radio over a 2 day period. The second was sponsored by GRAPES in Atlanta Georgia in November of 1985. The format was the same as the first and added a beginner section and a series of state presentations running simultaneously with 2 technical sessions. Over 150 people attended both of these meetings. The third already mentioned was in competition with The ARRL Networking Conference and The Orlando Hamfest. Although many of the members were present it was nearly impossible to manage more than some private conversations and conferences. These conferences are invaluable in my opinion. In the relatively early development of packet redio and the infancy of networking it is mandatory that we discuss developments face to face on a regional basis at least 2 times a year.

WHERE IS THE NEXT MEETING?

As far as I know there was no projection for the next meeting. If I am wrong please correct me. If not I would like to suggest one weekend in November prior to Thanksgiving. Gulfport? Birmingham? Columbia? Myrtle Beach? Nashville? Someone please get up and volunteer before next month so we can get the details out soon. Consider charging a few bucks to cover your expenses. GRAPES invested about $350 and about $200 of personal donations. I don't think anyone will mind a small head charge. The agenda? Well, if we get a volunteer site, I will make suggestions from the mailin's next month. For now consider Technical Sessions and Demonstrations.

- PRM -

DATELINE, continued from page 12.

to join us. Dues are $20 and include not only the quarterly RMPRA > Packet Newsletter but an annual subscription to this national Packet Radio Magazine. Contact Linc Haymaker, K0ZCO - RMPRA Secretary, 3775 E. 115th Ave, Thornton, CO 80233 for info.

- PRM -

Cactus Corner, continued from page 5.

If you use an XR2211 PLL demodulator in your modem, and you want to use it on HF, note that the resistor between XR2211 pins 11 and 12 should be 180k and the resistor between pins 7 and 8 should be 750k. The capacitor from pin 8 to ground should be 0.01 uF.

Until next month, keep those packets flying.

(Speaking of next month, an NNC update should be in order.)

- PRM -

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Connect – The Beginner's Column

Don Deem, KB4LLO

As many of you old timers know, "Connect" was a fairly regular column in the FADCA > BEACON and was primarily devoted to those new to packet radio. With the editor's kind permission, I would like to continue to devote a portion of this monthly offering ot beginners as well as other areas of possible interest in which I am involved.

As anyone can tell, our ranks here in Florida are continuing to swell at an alarming rate. I'm sure that what we are experiencing here is a reflection of what is happening all across our country. As a result of this explosive growth, we must teach those new individuals coming on the network the local operating procedures as soon as possible, to reduce the unnecessary loss of air time due to the new operator trying out his new "wings". What I am saying is that it is wrong for the new guy to come on line and disrupt the operation of the local network. One thing that all packeteers should remember is this, a packet network is exactly like a great big party-line, with everyone talking at the same time. Your neighbor has an Equal right to air time, the same as you or anyone else. My suggestion is this, when a new operator comes on line, he should contact on of the LAN officers or an experienced LAN member to find out what the local operating practices are. Each LAN should be responsible for the education of the operators in their respective areas. An idea that I think merits our consideration is the establishment of a local LAN training or experimental frequency, where operators could go for training sessions. Of course the operators would not have use of the LAN wide-area digipeators but could use other stations as digipeators.

There are some basic procedures that seem to be fairly constant from LAN to LAN, here are a few of them:

1. Turn your CWID off, it is no longer a requirement for indentification.
2. Refrain from unnecessary beaconing, if you choose to beacon do so at a reasonable rate.
3. Do not beacon from an unattended station, it really serves no purpose.
4. Refrain from using the control G, nothing pegs a new comer than a control G on every packet. Remember, the control G sounds at every terminal in range, not just with the guy you are in QSO with.

If you wish to use a local PBBS or network switch, and you are unsure of the proper method of access, contact the control operator or sysop for assistance. This way you save the embarassment of crashing the system, causing someone a great deal of work. A good thing to remember is that all of us were beginners not so long ago. but then a crowded net was five or six stations. just a few moments ago, I glanced at the scrolling terminal screen to my left and from my QTH I was able to monitor the activity of three bulletin board systems, a network switch, and operators from Gainesville to Homestead. There are those who are leaving our ranks in numbers larger than I like to see, because of what they see as a system that is growing at an almost uncontrollable rate. They remember the early days when their evening enjoyment was enhanced by an hour or so at the keyboard. I would like to say to these packeteers, hey guys, don't leave us now, with your help we will solve these temparary problems so that we all can enjoy our hobby. There is room ofr everyone and a solution for every problem.

If you have a specific problem or questions you would like answered, drop me a line at the FADCA address on the front of PRM. With your permission we will print your question and an answer.

At a recent Tampa LAN meeting, the topic of discussion was bulletin board commands and how to use them. As usual the meeting was enjoyable and lasted until almost 2300 hrs. I'm going to cover those same commands, and give a brief description when required. I want to thank Andy, KC2FF, for the handout and material.

First are the general commands (the letters that you see when you bring the mailbox up). Oh, by the way, these commands are for WORLI- version 11.3- 1/15/86.

B- Bye.. This command is how you exit the mailbox after concluding your business. This command is forced if there is no response to a menu within 4 minutes.

G- Activate the gateway..If the mailbox is so equipped. Check this one with your SYSOP.

H- Display the help text. This information will help you out of some temporary difficulties.

I- Display information about the system. Interesting information, try it next time into the mailbox.

J- Display the calls of stations recently heard or connected.

N- Enter your first name if it does not exceed 12 characters, and the next time you check in, you will be greeted by name. A personal touch.

P- This command will tell you the path from you to any call you specify.

```
P <call>
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T- Used when you wish to alert the Sysop. If he doesn't respond within one minute, you are asked to leave a message.

X- Toggles between the short menu and the long menu.

It is important to remember to be cool when you give the mailbox a command. If it doesn't respond immediately, don't assume it didn't hear you and send another command. Give the system time to work, and it will serve you well.Multiple commands mean multiple responses.

The next group of commands to be discussed are commands that apply to messages.

More >>>

K- Kills a message or messages. When used with the qualifier M (kill mine), it will erase all of your messages marked as read. When used with the qualifier T it will erase NCS traffic sent to you for delivery, and will send an automatic message to the originator indicating that the traffic was delivered. The final option is called the argument and is a specific message number (K ####), or kill message ####.

L- List messages. With no qualifier, all the messages entered since you last logged in will be displayed.

LA- ARRL bulletins only

LB- General interest bulletins only.

LF- List msgs forwarded, not yet killed.

LL (N)- List the last N messages. Don't forget the space between the L's and the number.

LM- List your messages only.

LT- List NTS traffic only.

LY- List messages read, but not yet killed.

L> (CALL)- List messages to the call given as the argument. Don't forget the space.

L< (CALL)- List messages from call given as the argument.

L@ (CALL)- List messages @ call given as the argument.

ARGUMENT- Number of the oldest message to list.
For LL, the number of msgs to list.
For L@,L<, and L>, the call.

R 101- Read message number 101. The message number, of course, corresponds to the message you wish to read.

RM- Read all messages addressed to you.

ARGUMENT- Message number to be read.

S- Informs the bbs that you wish to send a message.

SB- Send a bulletin.

SP- Send a private message.

SS- A service message, generated by the mailbox.

ST- Used for NTS traffic.

This next group of commands apply only to file transfers.The mailbox will accept standard CP/M filenames. This includes up to an 8 character maximum name with a 3 character maximum extension. Examples are: DOC.TNC TANNER.DOC etc.

D- Download a file from the mailbox. The argument is the file name. An example: D DOC.TNC

U- Upload a file to the mailbox. The argument is the file name. The end of the file is indicated by the operator sending a CTRL-Z at the end of the file.

W- Displays all files presently stored on disk, as well as available space.

This covers all commands, except for those that pertain to the use of the gateways. Those commands will be covered at a later date when more mailboxes have the gateway capability enabled. If i have missed any, please drop me a line. I hope to see all of you on the keyboard soon.....73's.

- PRM -

PACKET RADIO FORUM: HAMVENTION 86

Bob Neben, K9BL, Forum Coordinator

The Packet Radio Forum has become the largest forum in the Hamvention. This year was no exception.

Packet Radio has grown to a point where there is too much information to convey to the audience in one session. Consequently, the forum was split into an introductory session and a technical development session, each attended by those interested in their particular area.

The Packet Radio Introduction and Tutorial Session was presented by Pete Eaton, WB9FLW, to an audience of about 300 people. Pete gave his usual outstanding talk on all aspects of Packet which interested both newcomers and oldtime packeteers alike.

Pete and Lyle Johnson, WA7GXD, wrote and distributed a paper on Poor Operating On Packet (POOP) and described techniques to keep channel utilization more efficient without driving everyone crazy with beacons.

The Packet Radio Technical Developments Session was presented by Lyle and Harold Price, NK6K. About 250 listened to their talks and I believe there was not much overlap between this group and the last, so total attendance was about 500.

Lyle described TAPR's activities including the Network Node Controller and other areas of the groups recent thrust. Harold described the satellites under development and level three activity in which AMSAT and other groups are involved.

The customary Packet Saturday night dinner was held this year at McNastys where over 300 people enjoyed a leisurely dinner and discussed packet radio. After dinner, it was off to the races at Malibu Gran Prix, where the packeteers again competed for the fastest time going around in circles. There is no stopping Packeteers!

Reprinted from THE CAPERS PAPERS, Cincinnati Area Packet Radio Society.

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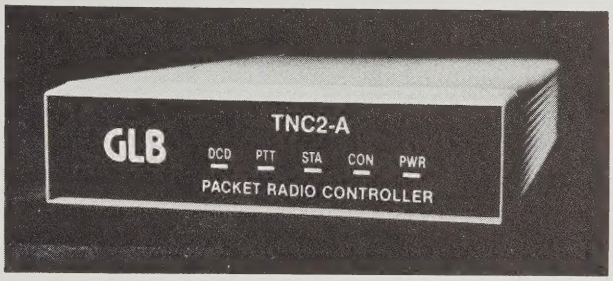

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